

# Di-LOG

...measurably better

## operating manual

### DL6403

1000A AC True RMS  
Digital Clamp Meter

### DL6404

1000A AC/DC True RMS  
Digital Clamp Meter



CE

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## Measurement Limits

DC Amperes	0.01A to 1000A (DL6404)
AC Amperes	0.01A to 1000A
DC Voltage	0.1mV to 600V
AC Voltage	0.1mV to 600V
Resistance	0.1 $\Omega$ to 40M $\Omega$
Capacitance	0.0001 nF TO 40 MF
Frequency	0.001 kHz to 4kHz
Temperature	-40°C to 1000°C -40°F to 1832°F

## Safety Notices

This manual contains information that must be followed for operating the meter safely and maintaining the meter in a safe operating condition. If this meter is not used in the manner specified, the protection provided may be impaired.

-  **Warning!** Warns of potential danger, refer to the instruction manual to avoid personal injury or damage to the meter.
-  **Caution!** Dangerous voltage. Danger of electrical shock
-  Continuous double or reinforced insulation complies with IEC536, class II
-  Symbol of conformity, confirms conformity with relevant EU directives. The meter complies with EMC directives (89/336/EEC). Specifically standards EN 50081-1 and EN 50082-1 as well as the Low Voltage Directive (73/23/EEC) described in the standard EN 61010-1.

The meter has been designed in accordance with the safety regulations for electronic measuring instruments, EN 61010-1, IEC 61010

Voltages above 75V DC or 50V AC may constitute a serious shock hazard.

Before using the meter check for physical damage to the casing in particular around the connectors. If the case is damaged do not use the meter.

## Safety Notices

Check the test leads for damaged insulation or exposed metal. Check the leads for continuity. Replace damaged leads with identical model or specification before using the meter.

Where applicable use GS38 approved leads (not supplied) these are available from Di-Log. When using test leads keep fingers behind the finger guards.

Do not apply more than the rated voltage, as marked on the meter between the terminals or between any terminal and ground.

Before making a measurement ensure that the rotary switch is set to the appropriate range. Do not turn the rotary switch whilst making a measurement.

Use the appropriate terminals, function and range for your measurements. If the value to be measured is not known use the maximum measurement position and reduce the range step by step until a satisfactory reading is obtained.

Do not use or store the meter in an environment of high temperature, humidity, fumes, vapour, gaseous, inflammable and strong magnetic field. The performance and safety of the use may be compromised in such circumstances.

Disconnect circuit power and discharge all high voltage capacitors before testing resistance, continuity, diodes, capacitance or current.

## Safety Notices

Before measuring current check the meters fuses and turn off power to the circuit before connecting the meter to the circuit.

Replace the battery as soon as the low battery indicator appears. If the battery is low the meter may give false readings.

Turn the meter power off when not in use,. Remove the battery if the meter is in use for a long period. Constantly check the battery as it may have leaked. A leaking battery will damage the meter.

The meter may only be opened by a qualified service technician for calibration and repair.

## Features

- True RMS measurement of AC Current and AC Voltage
- Large 4000 count LCD display with a bargraph and a bright white LED backlight.
- Wide measuring range from 0.01A AC/DC up to 1000A AC/DC (DC only on DL6404)
- Measures AC and DC Voltage up to 600 volts
- Measures resistance from  $0.01\Omega$  up to  $40M\Omega$ .
- Capacitance measurements up to 40mF
- Temperature measurement from  $-40^{\circ}\text{C}$  to  $+1000^{\circ}\text{C}$  and  $-40^{\circ}\text{F}$  to  $1832^{\circ}\text{F}$ .
- Designed to the international safety standard IEC61010 CAT III 600V / CAT II 1000V, Pollution degree 2.
- Auto Power Off after approximately 20 minutes to conserve battery life.
- Continuity Buzzer and Diode Test
- Frequency measurement up to 4kHz.
- Peak Hold to record the minimum and maximum readings for current and voltage.
- Data Hold switch used to freeze reading on display

### Controls and Connections


1. Transformer Jaws
2. Jaw Trigger
3. Function Switch
4. Data Hold Button
5. Mode Button
6. Peak Hold Button for Volts and Current
7. Backlight Button
8. Display
9. COM Terminal
10. Volt, Resistance, Capacitance,  
Temperature Terminal



## Instrument Layout



## Specifications

Clamp Size	30mm Opening Approx.
Diode Test	Test Current of 0.3mA typical; Open circuit voltage 1.5V DC
Continuity Check	Threshold <35 $\Omega$ : Test current <1mA
Low Battery Indication	"  " is displayed
Overrange Indication	"OL" is displayed
Measurements Rate	2 per second, nominal
Input Impedance	10M $\Omega$ (VDC and VAC)
Display	4000 count LCD
AC Current	50/60Hz (AAC)
AC Voltage Bandwidth	50/60Hz (VAC)
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-30°C to 60°C (-22°F to 140°F)
Relative Humidity	Up to 85%
Over Voltage	Category III 600V
Battery	One DC 9V IEC 6F22.16404. Battery
Auto Power Off	Approx 20 minutes
Dimensions	229 x 80 x 49mm
Weight	303g

## Specifications

### DC Current (DL6404 only)

Range	Measuring Range	Resolution	Accuracy (% of Reading)
40A	0 ~ 40.00A	0.01 A	± (2.8% + 10 digits)
400A	0 ~ 400.0A	0.1A	± (2.8% + 8 digits)
1000A	0 ~ 1000A	1A	± (3.0% + 8 digits)

### AC Current

Range	Measuring Range	Resolution	Accuracy (% of Reading)
40A	0 ~ 40.00A	0.01 A	± (2.8% + 10 digits)
400A	0 ~ 400.0A	0.1A	± (2.8% + 8 digits)
1000A	0 ~ 1000A	1A	± (3.0% + 8 digits)

### DC Voltage

Range	Measuring Range	Resolution	Accuracy (% of Reading)
400mV	0 ~ 400.0mV	0.1mV	± (0.8% + 2 digits)
4V	0 ~ 4.000V	0.001V	± (1.5% + 2 digits)
40V	0 ~ 40.00V	0.01V	
400V	0 ~ 400.0V	0.1V	
600V	0 ~ 600V	1V	± (2.0% + 2 digits)

### AC Voltage

Range	Measuring Range	Resolution	Accuracy (% of Reading)
400mV	0 ~ 400.0mV	0.1mV	± (1.0% + 4 digits)
4V	0 ~ 4.000V	0.001V	± (1.5% + 8 digits)
40V	0 ~ 40.00V	0.01V	
400V	0 ~ 400.0V	0.1V	
600V	0 ~ 600V	1V	± (2.0% + 8 digits)

## Specifications

### Resistance

Range	Measuring Range	Resolution	Accuracy (% of Reading)
400 $\Omega$	0 ~ 400.0 $\Omega$	0.1 $\Omega$	$\pm$ (1.0% + 4 digits)
4k $\Omega$	0 ~ 4.000k $\Omega$	1 $\Omega$	$\pm$ (1.5% + 2 digits)
40k $\Omega$	0 ~ 40.00k $\Omega$	10 $\Omega$	
400 $\Omega$	0 ~ 400.0k $\Omega$	100k $\Omega$	
4M $\Omega$	0 ~ 4.000M $\Omega$	1k $\Omega$	$\pm$ (2.5% + 5 digits)
40M $\Omega$	0 ~ 40.00M $\Omega$	10k $\Omega$	$\pm$ (3.5% + 10 digits)

### Capacitance

Range	Measuring Range	Resolution	Accuracy (% of Reading)
4nF	0 ~ 4.000nF	0.001nF	$\pm$ (5.0% + 30 digits)
40nF	0 ~ 40.00nF	0.01nF	$\pm$ (5.0% + 20 digits)
400nF	0 ~ 400.0nF	0.1nF	$\pm$ (3.0% + 5 digits)
4 $\mu$ F	0 ~ 4.000 $\mu$ F	0.001 $\mu$ F	
40 $\mu$ F	0 ~ 40.00 $\mu$ F	0.01 $\mu$ F	
400 $\mu$ F	0 ~ 400.0 $\mu$ F	0.1 $\mu$ F	$\pm$ (4.0% + 10 digits)
4mF	0 ~ 4.000mF	0.001mF	$\pm$ (4.5% + 10 digits)
40mF	0 ~ 40.00mF	0.01mF	$\pm$ (5.0% + 10 digits)

### Frequency

Range	Measuring Range	Resolution	Accuracy (% of Reading)
4kHz	0 ~ 4.000kHz	0.001kHz	$\pm$ (1.5% + 2 digits) Sensitivity: 5Vrms min

### Temperature

Range	Measuring Range	Resolution	Accuracy (% of Reading)
$^{\circ}$ C	-40 $^{\circ}$ C ~ 1000 $^{\circ}$ C	1 $^{\circ}$ C	$\pm$ (2.5% + 3 $^{\circ}$ C)
$^{\circ}$ F	-40.0 $^{\circ}$ F ~ 1832 $^{\circ}$ F	1 $^{\circ}$ F	$\pm$ (2.5% + 5 $^{\circ}$ F)

## DC Current Measurement (DL6404)

**⚠ WARNING:** Ensure that the test leads are disconnected from the meter before making current measurements.

1. Set the function switch to **1000A** or **400A** or **40A** range position and make sure that the current under test does not exceed the upper limit of the measuring range you have selected. The meter automatically defaults to DC Current.
2. Press the **DC ZERO** button once (DL6404), the  $\Delta$  sign will appear on the LCD indicating Range is zero.
3. Press the trigger to open up the transformer jaws and clamp around the single conductor under test.
4. Read the display.

**Note:**

- During current measurements keep the transformer jaws fully closed. Otherwise this will affect the accuracy of the measurement.
- When measuring large currents the transformer jaws may buzz. This is not a fault and does not affect the accuracy of the reading.

**Correct Current Measurement**



**Incorrect Current Measurement**



## AC True RMS Current Measurement

**⚠ WARNING:** Ensure that the test leads are disconnected from the meter before making current measurements.

1. Set the function switch to **1000A~** or **400A~** or **40A~** range position, and make sure that the current under test does not exceed the upper limit of the measuring range you have selected.
2. Press the **MODE** button to select the AC Current range. The meter automatically defaults to DC Current.
3. Press the trigger to open up the transformer jaws and clamp around the single conductor under test.
4. Read the display.

**Note:**

- During current measurements keep the transformer jaws fully closed, otherwise this will affect the accuracy of the measurement.
- When measuring large currents the transformer jaws may buzz. This is not a fault and does not affect the accuracy of the reading.
- The meter is set to default to "Auto Range" mode.
- Pressing the **PEAK** hold button will allow the user to record the peak maximum and minimum readings on the AC volt range. See page 17 for further instructions for "PEAK" Hold function.

### Correct Current Measurement

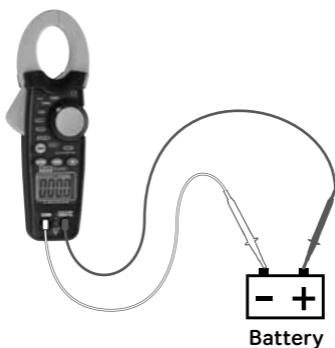


### Incorrect Current Measurement



## DC Voltage Measurement

1. Set the function switch to **V $\overline{\text{Hz}}$**  range position. The meter automatically defaults to DC Volts.
2. Insert the red test lead into the “**V  $\Omega$  TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
3. Connect the other end of the test leads to the circuit under test.
4. Read the display. If a “-” sign is displayed, the red lead is the negative potential.

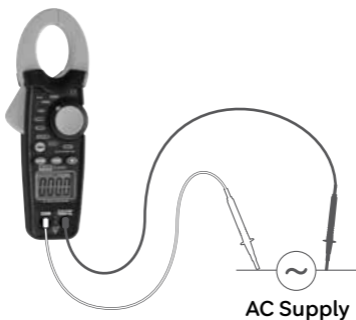


## AC True RMS Voltage Measurement

1. Set the function switch to **V $\sqrt{\text{Hz}}$**  range position.
2. Press the **MODE** button to select the AC Volt range. The meter automatically defaults to DC Volts.
3. Insert the red test lead into the "**V  $\Omega$  TEMP HZ**" input terminal and the black lead to the "**COM**" terminal.
4. Connect the other end of the test leads to the circuit under test. Take the reading on the display.

**Note:**

- The meter is set to default to "Auto Range" mode.
- Pressing the **PEAK** hold button will allow the user to record the peak maximum and minimum readings on the AC Volt range. See page 17 for further instructions for "**PEAK**" Hold function.





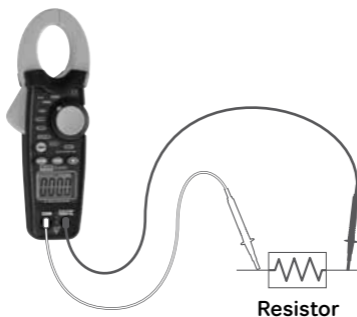
## Resistance Measurement

1. Set the function switch to **Ω** range position. The meter automatically defaults to resistance range.
2. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
3. Connect the other end of the test leads to the circuit or component under test. Take the reading on the display.

**Note:** • The meter is set to default to “**Auto Range**” mode.



• **WARNING** before attempting to make a resistance measurement, ensure there is no voltage present on the circuit under test.



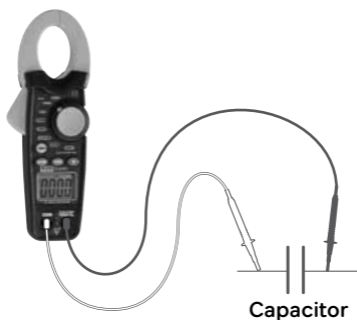
## Capacitance Measurement

1. Set the function switch to **CAP** range position.
2. Insert the red test lead into the “V  $\Omega$  TEMP HZ” input terminal and the black lead to the “COM” terminal.
3. Connect the other end of the test leads to the circuit or component under test. Take the reading on the display.

**Note:** • In Capacitance range the meter is Auto Ranging only.



- **CAUTION** to avoid damage to the meter or the equipment under test, remove all power from the circuit and discharge all capacitors before measuring capacitance.
- Large value capacitors should be discharged through an appropriate resistance load. Use the DC Voltage function to confirm that the capacitor is discharged.



## Frequency Measurement

1. Set the function switch to **V $\approx$ Hz** range position. The meter automatically defaults to the Frequency range.
2. Press the **MODE** button for 3 seconds to select the Frequency range. The meter automatically defaults to DC Volts.
3. Insert the red test lead into the “**V  $\Omega$  TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
4. Connect the other end of the test leads to the circuit or component under test. Take the reading on the display.

**Note:** • In the Frequency range the meter is Auto Ranging only.

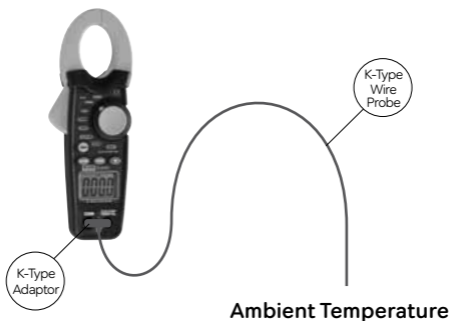


Measuring Frequency  
on AC Supply


## Temperature Measurement

1. Set the function switch to **TEMP** range position. The meter automatically defaults to °C range.
2. Insert the meter white temperature adaptor into the “V Ω TEMP HZ” input terminal and the “COM” terminal. Ensure that the “-” marking on the adaptor is inserted into the “COM” terminal and the “+” marking on the adaptor is inserted into the “V Ω TEMP HZ” input terminal.
3. Connect any K-Type probe into the meter adaptor and measure the temperature of the apparatus or area required.
4. Read the temperature directly on the display.
5. To change the measuring unit from °C to °F, press the **MODE** button to select the °F unit.

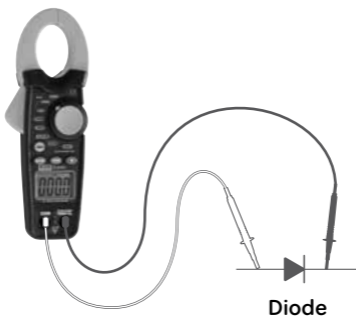
**Note:** • The meter is set to default to “Auto Range” mode.



## Diode Test

1. Set the function switch to  range position.
2. Press the **MODE** button to select the Diode Test range. The meter automatically defaults to Resistance.
3. Insert the red test lead into the “V  $\Omega$  TEMP HZ” input terminal and the black lead to the “COM” terminal.
4. Connect the other end of the test leads to the component under test. Read the display.

- Note:**
- Use the diode test to check diodes, Transistors, silicon controlled rectifiers (SCR's) and other semiconductor devices.
  - The test sends a current through a semiconductor junction, then measures the junction's voltage drop.
  - Normal forward voltage drop (forward bias) for a good silicon diode is between 0.4V to 0.9V. A reading higher than that indicates a leaky (defective) diode. A zero reading indicates a shorted diode.
  - Reverse the test leads connection (reverse bias) across the diode. The display shows “OL” if the diode is good. Any other readings indicate the diode is shorted or resistive (defective).



## Continuity Testing

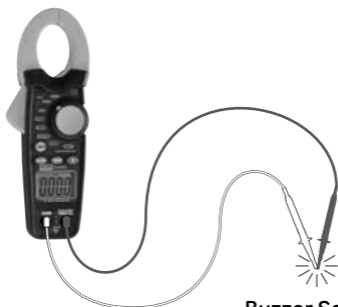
1. Set the function switch to  $\rightarrow \gg \Omega$  range position.
2. Press the **MODE** button to select the Continuity Test range. The meter automatically defaults to Resistance.
3. Insert the red test lead into the “**V  $\Omega$  TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
4. Short the tips of the test leads and make sure the display reads “**0**” and the buzzer beeps.
5. Connect the tip of the test leads to the circuit or component under test. The display reads the resistance and the buzzer beeps when the reading is not more than about  $35\Omega$ .

**Note:** • Using resistance and continuity function in a live circuit will produce false results and may damage the instrument.

• In many cases the suspicious components must be disconnected from the circuit under test to obtain accurate results.



• **WARNING** before attempting to make a test, ensure there is no Voltage present on the circuit.



**Buzzer Sounds**

## DATA HOLD

This is a function used to freeze the reading on the display, ideal for later viewing.

1. Press the **HOLD** button once. When the Hold is activated, the meter beeps, freezes the reading, and displays the "HOLD" indicator on the LCD.
2. To deactivate the "HOLD" function, press **HOLD** button once, the meter will beep and the meter will start reading new measurements.



## PEAK HOLD

This is a function used to record the maximum and minimum readings on the display for the voltage and current ranges.

1. Press the **PEAK** button once. This will record the "PEAK" maximum, the meter beeps, and displays the "P MAX" indicator on the LCD.
2. Press the **PEAK** button again. This will record the "PEAK" minimum, the meter beeps, and displays the "P MIN" indicator on the LCD.
3. To deactivate the "PEAK" function, press the button for 3 seconds, the meter will beep and the meter will start reading new measurements.

## LCD BACKLIGHT

The backlight is ideally used in dark or dimly lit areas.


1. Press the  button for 3 seconds, and the bright white light will come on.
2. To turn off the backlight press the  button for 3 seconds.

**Note:** The use of the backlight will reduce the battery life considerably.

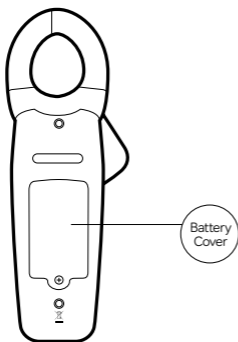
## AUTO POWER OFF

This feature automatically turns off the meter after approximately 20 minutes from the last measurement taken. To turn on the meter, press any button or move the rotary switch to any position. Ensure that test leads are disconnected from any circuit to avoid injury or meter damage.

## Battery Replacement

When the  sign appears on the LCD, this indicates the battery should be replaced. Use the following procedure to replace the standard 9V battery (IEC 6F 22) battery.

1. Disconnect the test leads from any live source and remove the leads from the input terminals.
2. Rotate the function switch to the **OFF** position.
3. The battery cover is secured to the bottom of the case by a screw. Using a screwdriver remove the screw from the battery cover and remove the battery cover from the meter.
4. Remove the old battery and replace it with a new IEC 6F 22 9 battery.
5. Replace the battery cover and reinstall the screw.





## Notes

## Notes

## Notes

Version DL6403

## Warranty & Maintenance

### 24 Month Warranty

Di-Log instruments are subject to stringent quality controls. If in the course of normal daily use a fault occurs we will provide a 24 month warranty (only valid with invoice).

Faults in manufacture and materials defect will be rectified by us free of charge, provided the instrument has not been tampered with and returned to us unopened.

Damage due to dropping abuse or misuse is not covered by the warranty.

Outside the warranty period we offer a full repair and re-calibration service.

### Maintenance

**WARNING** Do not attempt to repair or service your meter unless you are qualified to do so and have the relevant calibration, performance test and service information.

To avoid electrical shock or damage to the meter do not get water inside the case.

Periodically wipe the case with a damp cloth and mild detergent. Do not use chemical solvent.

Clean the input terminals with cotton bud, as dirt or moisture in the terminals can affect readings.

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